

**WHAT IS CLAIMED IS:**

1. A method for communication using a plurality of time slots within a frequency spectrum, the method comprising the steps of:

5 establishing a fast frequency hopping traffic channel between a first and a second communication unit, the fast frequency hopping traffic channel having a set of the plurality of time slots and a first set of hop carrier frequencies within the frequency spectrum; and

10 establishing a slow frequency hopping traffic channel between a third and a fourth communication unit, the slow frequency hopping traffic channel having a second set of hop carrier frequencies within the frequency spectrum.

2. The method of claim 1, further comprising the step of communicating one or more first data packets on one or more of the set of the plurality of time slots from the first communication unit to the second communication unit over the fast frequency hopping traffic channel at a rate of between 1-3 Mb/s.

15 3. The method of claim 1, further comprising the step of communicating one or more first data packets on one or more of the set of the plurality of time slots from the third communication unit to the fourth communication unit over the slow frequency hopping traffic channel at a rate exceeding 5 Mb/s.

20 4. The method of claim 1, wherein the step of establishing the slow frequency hopping traffic channel further comprises the step of establishing an initial location of the slow frequency hopping traffic channel according to a slow hop sequence.

5. The method of claim 4, wherein the step of establishing the slow frequency hopping traffic channel further includes the steps of:

determining that a time interval associated with the slow hop sequence has expired; and

adapting the location of the slow frequency hopping traffic channel according to the slow hop sequence responsive to the expiration of the time  
5 interval.

6. The method of claim 5, further comprising the step of communicating one or more first data packets on one or more of the first set of the plurality of time slots from the first communication unit to the second communication unit over the fast frequency hopping traffic channel such that the initial location and the adapted  
10 location are avoided by the fast frequency hopping traffic channel.

7. The method of claim 4, wherein the step of establishing the location further includes reducing a number of hop carrier frequencies associated with the fast frequency hopping traffic channel.

8. The method of claim 1, further comprising the steps of:

15 establishing the fast frequency hopping traffic channel between the first, the second, and the third communication unit; and

wherein the fast frequency hopping traffic channel avoids the location of the slow frequency hopping traffic channel and wherein a beacon packet is transmitted to the third communication unit, the beacon packet containing  
20 frequency hopping related information.

9. The method of claim 8, wherein the first communication unit is a master communication unit, the second communication unit is a FFH slave unit, and the third communication unit is a SFH slave unit, and wherein the method further comprises the step of periodically transmitting the beacon packet from the master

to the FFH and SFH slave units over the fast frequency hopping traffic channel, the beacon packet indicating to the FFH and SFH slave units the location of the slow frequency hopping traffic channel.

10. An apparatus for communication using a plurality of time slots within a  
5 frequency spectrum, the apparatus comprising:

a first, second, third, and fourth communication unit coupled together over an air interface;

wherein the first communication unit is configured to:

10 establish a fast frequency hopping traffic channel between a first and a second communication unit, the fast frequency hopping traffic channel having a set of the plurality of time slots and a first set of hop carrier frequencies within the frequency spectrum; and

15 establish a slow frequency hopping traffic channel between the third and the fourth communication unit, the slow frequency hopping traffic channel having a second set of hop carrier frequencies within the frequency spectrum.

11. The apparatus of claim 10, wherein the first communication unit is further configured to communicate one or more first data packets on one or more of the first set of the plurality of time slots from the first communication unit to the second communication unit over the fast frequency hopping traffic channel at a rate of between 1-3 Mb/s.

20 12. The apparatus of claim 10, wherein the first communication unit is further configured to communicate one or more first data packets on one or more of the first set of the plurality of time slots from the third communication unit to the fourth communication unit over the slow frequency hopping traffic channel at a rate exceeding 5 Mb/s.

13. The apparatus of claim 10, wherein the first communication unit, in establishing the slow frequency hopping traffic channel, is further configured to establish an initial location of the slow frequency hopping traffic channel according to a slow hop sequence.

5 14. The apparatus of claim 13, wherein the first communication unit, in establishing the slow frequency hopping traffic channel, is further configured to:  
determine that a time interval associated with the slow hop sequence has expired; and  
adapt the location of the slow frequency hopping traffic channel according to the slow hop sequence responsive to the expiration of the time interval.

10 15. The apparatus of claim 14, wherein the first communication unit is further configured to communicate one or more first data packets on one or more of the set of the plurality of time slots from the first communication unit to the second communication unit over the fast frequency hopping traffic channel such that the initial location and the adapted location of the slow frequency hopping traffic channel is avoided by the fast frequency hopping traffic channel.

15 16. The apparatus of claim 13, wherein the first communication unit is further configured to reduce the number of time slots associated with the set of the plurality of time slots.

20 17. The apparatus of claim 10, wherein the first communication unit is further configured to :  
establish the fast frequency hopping traffic channel between the first, the second, and the third communication unit; and

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wherein the fast frequency hopping traffic channel avoids the location of the slow frequency hopping traffic channel and wherein a beacon packet is transmitted to the third communication unit, the beacon packet containing frequency hopping related information.

5        18. The apparatus of claim 17, wherein the first communication unit is a master communication unit and the second communication unit is a FFH slave unit, and the third communication unit is a SFH slave unit, and wherein the first communication unit is further configured to periodically transmit a beacon packet from the master to the FFH and SFH slave units over the fast frequency hopping traffic channel, the beacon packet indicating to the FFH and SFH slave units the location of the slow frequency hopping traffic channel.

10        19. A method for communication using a plurality of time slots within a frequency spectrum, the method comprising the steps of:

15              establishing a frequency hopping traffic channel between a first and a second communication unit, the fast frequency hopping traffic channel having a set of the plurality of time slots and a first set of hop carrier frequencies within the frequency spectrum; and

20              establishing a static traffic channel between a third and a fourth communication unit, the static traffic channel having a carrier frequency within the frequency spectrum.

20. The method of claim 19, further comprising the step of communicating one or more first data packets on one or more of the set of the plurality of time slots from the first communication unit to the second communication unit over the fast frequency hopping traffic channel at a rate of between 1-3 Mb/s.

21. The method of claim 19, further comprising the step of communicating one or more first data packets from the third communication unit to the fourth communication unit over the static traffic channel at a rate exceeding 5 Mb/s.

5 22. The method of claim 19, wherein the step of establishing the static traffic channel further comprises the step of establishing an initial location of the static traffic channel according to dynamic channel allocation.

23. The method of claim 22, wherein the step of establishing the static traffic channel further includes the steps of:

10 determining that a frequency overlap exists between the static traffic channel and one or more of frequencies associated with the frequency hopping traffic channel; and

suspending communication on the static traffic channel during the overlap.

24. The method of claim 19, further comprising the steps of:

15 establishing the frequency hopping traffic channel between the first, the second, and the third communication unit; and

wherein a beacon packet is transmitted to the third communication unit, the beacon packet associated with the frequency hopping traffic channel.

20 26. The method of claim 25, wherein the first communication unit is a master communication unit, the second communication unit is a FH slave unit, and the third communication unit is a HS slave unit, and wherein the method further comprises the step of periodically transmitting the beacon packet from the master to the FH and HS slave units over the frequency hopping traffic channel, the beacon packet indicating to the FH and HS slave units the location of the frequency hopping traffic channel.

27. An apparatus for communication using a plurality of time slots within a frequency spectrum, the apparatus comprising:

an air interface; and

5 a first, second, third, and fourth communication unit coupled together over the air interface, the first communication unit is configured to:

establish a frequency hopping traffic channel between the first and the second communication unit, the frequency hopping traffic channel having a set of the plurality of time slots and a first set of hop carrier frequencies within the frequency spectrum; and

10 establish a static traffic channel between the third and the fourth communication unit, the static traffic channel having a carrier frequency within the frequency spectrum.

28. The apparatus of claim 27, wherein the first communication unit is further configured to communicate one or more first data packets on one or more of the first set of the plurality of time slots from the first communication unit to the second communication unit over the frequency hopping traffic channel at a rate of between 1-3 Mb/s.

15 29. The apparatus of claim 27, wherein the third communication unit is further configured to communicate one or more first data packets from the third communication unit to the fourth communication unit over the static traffic channel at a rate exceeding 5 Mb/s.

20 30. The apparatus of claim 27, wherein the first communication unit, in establishing the static traffic channel, is further configured to establish an initial location of the static traffic channel according to dynamic channel allocation.

31. The apparatus of claim 30, wherein the first communication unit, in establishing the static traffic channel, is further configured to:

determine that a frequency overlap exists between the static traffic channel and one or more of frequencies associated with the frequency hopping traffic channel; and

suspend communication on the static traffic channel during the overlap.

5 32. The apparatus of claim 27, wherein the first communication unit is further configured to :

10 establish the frequency hopping traffic channel between the first, the second, and the third communication unit; and

wherein a beacon packet is transmitted to the third communication unit, the beacon packet associated with the frequency hopping traffic channel.

15 33. The apparatus of claim 32, wherein the first communication unit is a master communication unit and the second communication unit is a FH slave unit, and the third communication unit is a HS slave unit, and wherein the first communication unit is further configured to periodically transmit the beacon packet from the master to the FH and HS slave units over the frequency hopping traffic channel, the beacon packet indicating to the FH and HS slave units the location of the frequency hopping traffic channel.

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